

SEMICONDUCTOR CAPACITOR DEVICE

What is claimed is:

- 5 1. A semiconductor capacitor device, comprising:
 a first MIM capacitor (C1) formed on a semiconductor substrate (1) and having a
 lower electrode (5), a first capacitor dielectric film (6) and an upper electrode (7); and
 a second MIM capacitor (C2) formed on the semiconductor substrate (1) and
 having the lower electrode (7), a second capacitor dielectric film (8) and an upper
10 electrode (9), wherein the lower electrodes (5, 7) and the upper electrodes (7, 9) of the
 first and second MIM capacitors are electrically connected in inverse parallel, and the
 second capacitor dielectric film (8) has a composition different from that of the first
 capacitor dielectric film (6).
- 15 2. The semiconductor capacitor device according to claim 1, wherein voltage
 dependences of capacitances of the first and second MIM capacitors (C1, C2) are
 expressed by respective quadratics of voltage, and coefficients of second-order terms of
 the quadratics have opposite signs.
- 20 3. The semiconductor capacitor device according to claim 2, the coefficients of
 the second-order terms of the quadratics for the first and second MIM capacitors have
 the same magnitude.
- 25 4. The semiconductor capacitor device according to claim 1, 2 or 3, wherein the
 first and second MIM capacitors (C1, C2) share a metal layer (7) that serves as the

upper electrode of the first MIM capacitor and the lower electrode of the second MIM capacitor.

5 5. The semiconductor capacitor device according to claim 1, 2 or 3, wherein one of the first and second capacitor dielectric films is composed of a silicon oxide film and the other of the first and second capacitor dielectric films is composed of a silicon nitride film.

10 6. The semiconductor capacitor device according to claim 1, the second MIM capacitor and the first MIM capacitor are laid mutually.

15 7. The semiconductor capacitor device according to claim 4, wherein the lower electrode (5) and the first capacitor dielectric film (6) of the first MIM capacitor (C1), the metal layer (7), and the second capacitor dielectric film (8) and the upper electrode (9) of the second MIM capacitor (C2) are stacked in this order, and the lower electrode (5) of the first MIM capacitor is electrically connected with the upper electrode (9) of the second MIM capacitor.